AMENDMENTS TO THE CLAIMS

This listing replaces all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) A method for identifying a material, comprising:

casting an incident photon beam on the material; [[and]]

detecting an emerging photon beam from the material with an array of fission-fragment detectors, a first set of scintillator paddles, and a second set of scintillator paddles, wherein the array of fission-fragment detectors, the first set of scintillator paddles, and the second set of scintillator paddles are sensitive to different ranges of photon beam energy; and

determining a photon energy regime of the emerging photon beam, the photon energy level identifying the material.

2. (Currently Amended) The method of claim 1, wherein identifying the material comprises ~~detecting~~ determining a range atomic number of the material in a container.

3. (Currently Amended) The method of claim 1, wherein detecting the emerging photon beam from the material with the array of fission-fragment detectors comprises detecting an energy range of the emerging [[a]] photon beam ~~energy~~ in a range between about 10 MeV to 20 MeV.

4. (Withdrawn) The method of claim 1, wherein detecting the emerging photon beam with the array of fission-fragment detectors comprises detecting the emerging photon beam with a tunable array of fission-fragment detectors.

5. (Withdrawn) The method of claim 4, wherein detecting the emerging photon beam with the tunable array of fission-fragment detectors includes using a target of atomic number substantially similar to the atomic number of the material.

6. (Currently Amended) The method of claim 1, wherein detecting the emerging photon beam from the material with the first set of scintillator paddles comprises detecting an energy range of the emerging [[a]] photon beam ~~energy~~ in a range up to about 6 MeV.

7. (Currently Amended) The method of claim 1, wherein detecting the emerging photon beam from the material with the second set of scintillator paddles comprises detecting an energy range of the emerging [[a]] photon beam ~~energy~~ exceeding about 6 MeV.

8. (Previously Amended) The method of claim 1, further comprising using a data acquisition and processing system to process a first signal from the array of fission-fragment detectors, a second signal from the first set of scintillator paddles, and a third signal from the second set of scintillator paddles.

9. (Currently Amended) The method of claim 8, further comprising creating a ~~histogram~~ photon distribution energy curve using ~~of the~~ a combination of the first signal from the array of fission-fragment detectors, the second signal from the first set of scintillator paddles, and the third signal from the second set of scintillator paddles.

10. (Withdrawn) A photon beam flux monitor for resolving a high-energy beam, comprising:

an array of fission-fragment detectors for measuring a first range of photon energies;

a first set of scintillator paddles coupled to the array of fission-fragment detectors for measuring a second range of photon energies;

a convertor coupled to the first set of scintillator paddles; and

a second set of scintillator paddles coupled to the convertor for measuring a third range of photon energies.

11. (Withdrawn) The photon beam flux monitor of claim 10, wherein the first, second and third range of photon energies overlap.

12. (Withdrawn) The photon beam flux monitor of claim 10, wherein the first, second and third range of photon energies do not overlap.

13. (Withdrawn) The photon beam flux monitor of claim 10, wherein the array of fission-fragment detectors comprises an array of tunable fission-fragment detectors.

14. (Withdrawn) The photon beam flux monitor of claim 10, wherein the array of fission-fragment detectors is sensitive to a photon energy of about 10 to 20 MeV.

15. (Withdrawn) The photon beam flux monitor of claim 13, wherein the array of tunable fission-fragment detectors comprises a target.

16. (Withdrawn) The photon beam flux monitor of claim 14, wherein the target comprises a film of ^{238}U.

17. (Withdrawn) The photon beam flux monitor of claim 10, wherein the first set of scintillator paddles is sensitive to a photon energy in a range up to about 6 MeV.

18. (Withdrawn) The photon beam flux monitor of claim 10, further comprising a first set of photo-multiplier tubes coupled to the first set of scintillator paddles.

19. (Withdrawn) The photon beam flux monitor of claim 10, wherein the second set of scintillator paddles is sensitive to a photon energy exceeding about 6 MeV.

20. (Withdrawn) The photon beam flux monitor of claim 10, further comprising a second set of photo-multiplier tubes coupled to the second set of scintillator paddles.

21. (Withdrawn) The photon beam flux monitor of claim 10, wherein the convertor is a lead convertor.

22. (Withdrawn) The photon beam flux monitor of claim 10, wherein the convertor is operable to produce electron/positron pairs.

23. (Withdrawn) A photon interrogation system, comprising:

an electron beam generator;

a radiator coupled to the electron beam generator;

an electron stopping block coupled to the radiator; and

a photon beam flux monitor in operative relation with the electron stopping block, the photon beam flux monitor comprising:

an array of fission-fragment detectors;

a first set of scintillator paddles coupled to the array of fission-fragment detectors;

a convertor coupled to the first set of scintillator paddles; and

a second set of scintillator paddles coupled to the convertor.

24. (Withdrawn) The photon beam flux interrogation system of claim 23, further comprising a data acquisition and processing system coupled to the photon beam flux monitor.

25. (Withdrawn) The photon beam flux interrogation system of claim 23, wherein the array of fission-fragment detectors comprises an array of tunable fission-fragment detectors.

26. (Withdrawn) The photon beam flux interrogation system of claim 25, wherein the array of tunable fission-fragment detectors comprises a target.

27. (Withdrawn) The photon beam flux interrogation system of claim 26, wherein the target comprises a film of ^{238}U.